Two stratified random sampling designs were considered, one based on randomizing points within stream order and the other based on randomizing within the sub-watersheds characterized by consultants. Stratified random sampling based on stream order was rejected because we suspected that stream orders would vary among watersheds in their proportion of total stream length, and *a priori* stratification would not account for such discrepancies. In contrast, a strictly random sampling design would be expected to distribute points among stream orders in proportion to the distribution of stream length by stream order. In other words, if 60% of the total stream length were first-order streams, then approximately 60% of random points would be expected to fall on first-order streams. Had one instead chosen to *a priori* sample 50% of points as first order streams, then the resulting watershed data would have under-represented the condition of first order streams.

Stratification by subwatershed was rejected because of the small size of some of the subwatersheds identified by consultants in Phase I of the project. Some of these subwatersheds were so small (1-3 km^2) that they would have had only one or two sample points assigned to them, which would not have been adequate to allow comparisons among subwatersheds. Increasing the sampling density above one site/km^2 catchment area could have overcome this problem, but would also have resulted in a much larger number of sample sites, and an unacceptable increase in cost.

Because of the unstratified random sampling strategy adopted, several tributaries were not assigned sampling points by chance. In retrospect, another approach would have been to adopt a stratified random sampling design stratified by subwatershed, but using larger sub-watersheds than the consultants originally circumscribed. This would have insured that each major tributary (as defined within a subwatershed) would have been assessed at a reasonable sampling density, and would have allowed comparison of its condition with other subwatersheds.

A refinement of the chosen sampling strategy would be to adopt a hierarchical approach. This approach is similar to that now used by EEP Planning. At the coarsest spatial scale, the least intensive assessment effort (Level I: using existing data, remote sensing data in GIS layers, etc.) is used in a manner similar to what is now done during Phase I by EEP, to identify areas in which to focus more intensive assessment. At an intermediate scale, a more intensive assessment effort (Level II: the ECU riparian assessment or similar method; present Phase II by EEP) is used with a stratified random approach based on subwatersheds (comprising major tributaries) to provide a basis for comparison among sub-watersheds and to conduct even more intensive assessment. At the finest scale, it may be appropriate to evaluate the entire stream length to identify specific restoration opportunities (as in the present Phase III by EEP). Such a hierarchical approach uses an appropriate level of assessment at a given spatial scale to provide information needed for a progressive narrowing of focus.

Random Assignment of Sampling Points in Watersheds

Sampling density of random points was approximately one point per km^2 of watershed area. For a drainage density of 1.0 km/km^2, this resulted in sampling density of one reach per 1 km of stream length. Since the assessment method evaluates a 300 ft reach, this means that approximately 10% of the total watershed stream length was assessed.